MELIOLASTER, A NEW GENUS OF THE MICROTHYRIACEAE.

By Ethel M. Doidge.

(Read August 21, 1918.)

As a result of the work of re-examination and revision of certain ascomycetes carried out in recent years by v. Höhnel and Theissen, the group formerly known as the Perisporiales* has been entirely reorganised. It was laid down by v. Höhnel† that only species showing the so-called "inverse-radial" structure of the perithecium should be included in the Microthyriaceae; a number of species with hemispherical perithecia but not showing this typical structure were thus excluded, and for these Theissen constituted the families *Hemisphaeriaceae*‡ and *Trichopeltaceae*,§ the latter group consisting of forms with a thallus-like structure, and with fruiting bodies formed "pycnotically" in the thallus. The three families, *Microthyriaceae, Hemisphaeriaceae* and *Trichopeltaceae,* constitute the group *Hemisphaeriales,* and are thus contrasted with forms having spherical perithecia like the *Perisporiaceae.* In both groups certain genera, *e.g. Meliola* and *Asterina,* bear hyphopodia at regular intervals on the mycelium; the division into families is based only on the structure of the fruiting bodies, but mycelial characters are often used as generic distinctions.

This being the case it is interesting to find amongst fungi occurring in South African forests, species which appear to be intermediate in character, and in which are combined peculiarities of more than one family. The vegetative stage of the *Trichopeltaceae* consists of a flat ribbon or disc formed by the repeated branching of the constituent hyphae, which are fused by their lateral walls; the "pycnothecia," as the fruiting bodies are called, are hemispherical, and are formed in the vegetative membrane by the thickening of certain portions of it. This group thus forms a very complete contrast to fungi like the *Meliolas* which have a filamentous, spreading mycelium, and spherical perithecia which are quite a distinct development from the vegetative mycelium.

* Engler, 'Die Pflanzenfamilien.'

† v. Höhnel, 'Fragm. z. Mijk.,' x, p. 13, ff.

‡ Theissen, 'Ann. Myc.,' xi (1913).

§ Theissen, 'Mycologische Centralb.,' iii, No. 6, pp. 273–286.

Meliola peltata,* a species found on *Podocarpus latifolia* and *P. falcata* (it does not to my knowledge occur on *P. elongata*), although its perithecia are spherical and its spores typical of the genus *Meliola*, in its vegetative stage strongly recalls the *Trichopeltaceae*. The spore on germination gives rise to hyphae, which branch repeatedly and become fused into a flat membrane, which develops into a more or less spherical disc. It differs from the vegetative thallus of the disc-forming *Trichopeltaceae* (*e.g. Brefeldiella*) only in the thicker hyphae which compose it, and in the presence of 2-celled hyphopodia, which can be traced on most of the branches forming the membrane.

In a recent collection from Buccleuch, Natal, an equally interesting fungus was found on the leaves and stems of *Piper capensis*. In this case the mycelium and spores are those of a typical *Meliola*, but the perithecium is of the *Microthyriaceae* type. The hyphae are thread-like, creeping over the leaf-surface, and bearing 2-celled capitate hyphopodia at regular intervals, and less frequently mucronate hyphopodia. The formation of the thyriothecium is similar to that of *Asterina*; a number of cells formed laterally on a hypha by repeated division (apparently by the septation of one of the hyphopodia) form a small group of parenchymatous cells between the mycelium and the leaf-surface, and these are the initial cells of the perithecial membrane. Each cell grows in a centrifugal direction, forming a series of radiating hyphae, which are fused by their lateral walls; thus a compact disc is formed, increase in circumference being provided for by the forking of the constituent hyphae. These hyphae are not fused for the whole of their length but are free at the circumference, giving the thyriothecium a fimbriate appearance. The thyriothecium differs from that of a typical *Asterina* only in the slightly stouter hyphae which form the membrane and in the presence of typical hyphopodia on the free ends of these hyphae. Dehiscence is stellate, as in *Asterina*, but the asci are 2-spored and evanescent as in *Meliola*, and the spores identical with those of the latter genus. This is interesting in view of Theissen's† statement that the hemispherical form of the fruiting body is evidently a development of the complete spherical form; that the thyriothecium of the *Microthyriaceae* has been reduced so that only the basal half has been formed, but this has been turned upside down and the perithecial wall is therefore "inverse."

There is no genus described with this type of perithecial membrane and 4-septate brown spores. I have therefore named this fungus *Meliolaster*, since it combines certain characters of the genera *Meliola* and *Asterina*.

Judging by the description given by Winter ('Hedwigia,' 1886, p. 96) and Gaillard ('Le Genre *Meliola*,' p. 58) it is possible that this fungus may

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* Doidge, E. M., 'Trans. Roy. Soc. S.A.,' vol. v, pt. 6, pp. 727 and 744, pl. lxi, fig. 18

† See footnote, p. 121.

be identical with *Meliola asterinoides* Wint., in which case it should be named *Meliolaster asterinoides* (Wint.), but as I have not seen specimens of *M. asterinoides*, and it is not safe to assume the identity of the two fungi without comparison, I have described the Buccleuch specimen as *Meliolaster Mackenzii* n. sp.

MELIOLASTER Doidge nov. gen. MICROTHYRIACEARUM.

Thyriothecia superficiala, atra, carbonacea, applanato-hemisphaerica, ex hyphis radiatis contexta demum stellatum dehiscentia. Mycelium hyphopodiatum. Asci aparaphysati. Sporidia 4-septata, brunnea.

Meliolaster Mackenzii Doidge n. sp.

Hypophylla, plagulas minutas, rotundatus, 1·5–2·5 mm. diam. formans; mycelio laxo, ex hyphis flexuosis vel fere rectis, 6–7 μ crassis composito; ramis alternis; cellulis 15–16 μ longis; hyphopodiis capitatis, alternis vel unilateralibus, brevissime stipitatis, curvatis, 10–15 × 6–7 μ, cellula superiore sub-globosa, convexa; hyphopodiis mucronatis ampullaceis, inter hyphopodia capitata sparsis, apice interdum sub-uncinatis, 12–15 × 6–7 μ; thyriotheciis dense aggregatis, orbicularibus vel a latere compressis, applanato-hemisphaericis, 250–350 μ diam., contextu ex hyphis rectis, 4–6 μ latis in articulos circum 10 μ longos divisis composito, peripherice copiose fimbriatis; ascis aparaphysatis, evanescentibus, ellipsoideis, bisporis, 50–57 × 20–23 μ; sporidiis cylindraceis, compressis vel sub-clavatis, 4-septatis, utrinque rotundatis, leniter constrictis, 33–37 × 10–13·5 μ.

Hab. in foliis *Piperis capensis*, 17/8/18, Buccleuch, Natal, leg. E. M. Doidge, M.H. No. 11570.

The formation of thyriothecia begins when the colony is quite small, the first being formed near the centre; one, two or more secondary thyriothecia then arise in close proximity, and these become flattened and the circular outline somewhat lost by coming into contact before growth is complete. As in *Meliola* the asci disappear as soon as the spores are formed, and before they change colour. The spores germinate as in *Meliola* and *Asterina* by producing hyphopodia first and then a hyphal branch, usually from the terminal cells. Hyphopodia are developed regularly as in many *Meliolas*, one being formed from each cell, in close proximity to the dividing wall.

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